

# **Pandemic Influenza: An Analysis of State Preparedness and Response Plans**

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## Summary

States are the seat of most authority for public health emergency response. Much of the actual work of response falls to local officials. However, the federal government can impose requirements upon states as a condition of federal funding. Since 2002, Congress has provided funding to all U.S. states, territories, and the District of Columbia, to enhance federal, state and local preparedness for public health threats in general, and an influenza (“flu”) pandemic in particular. States were required to develop pandemic plans as a condition of this funding.

This report, which will not be updated, describes an approach to the analysis of state pandemic plans, and presents the findings of that analysis. State plans that were available in July 2006 were analyzed in eight topical areas: (1) leadership and coordination; (2) surveillance and laboratory activities; (3) vaccine management; (4) antiviral drug management; (5) other disease control activities; (6) communications; (7) healthcare services; and (8) other essential services. A history of federal funding and requirements for state pandemic planning is provided in an **Appendix**. *This analysis is not intended to grade or rank individual state pandemic plans or capabilities.* Rather, its findings indicate that a number of challenges remain in assuring pandemic preparedness, and suggest areas that may merit added emphasis in future planning efforts.

Generally, the plans analyzed here reflect their authorship by public health officials. They emphasize core public health functions such as disease detection and control. Other planning challenges, such as assuring surge capacity in the healthcare sector, the continuity of essential services, or the integrity of critical supply chains, may fall outside the authority of public health officials, and may require stronger engagement by emergency management officials and others in planning.

Since different threats—such as hurricanes, earthquakes or terrorism—are expected to affect states differently, many believe that states should have flexibility in emergency planning. This complicates federal oversight of homeland security grants to states, however. Which requirements should be imposed on all states? When is variability among states desirable, and when is it not? A flu pandemic is perhaps unique in that it would be likely to affect all states at nearly the same time, in ways that are fairly predictable. This may argue for a more directive federal role in setting pandemic preparedness requirements. But the matter of what the states should do to be prepared for a pandemic is not always clear. For example, uncertainties about the ways in which flu spreads, the lack of national consensus in matters of equity in rationing, and a long tradition of federal deference to states in matters of public health, all complicate efforts to set uniform planning requirements for states.

In addition to assuring the strength of planning efforts, readiness also depends on assuring that states can execute their plans. This assurance can be provided through analysis of the response during exercises, drills, and relevant real-world incidents. Such an analysis is not within the scope of this report.

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## Background

In 1997, a new strain of avian influenza (“bird flu”)—named H5N1 for its genetic makeup—emerged in Hong Kong and killed six people. It has since spread to other countries in Asia, Europe and Africa, where it has infected more than 300 people, killing more than half of them. The situation has raised concern about the possibility of a global human pandemic.<sup>1</sup> A flu pandemic of modest severity would strain public health and healthcare systems worldwide. And, although flu viruses do not directly harm physical infrastructure, a severe pandemic could nonetheless affect infrastructure and commerce through high absenteeism, supply chain disruptions, and other effects.

Public health functions in the United States are decentralized, with states in the lead for most public health authorities, such as disease surveillance and quarantine. In many states, local public health authority is also decentralized, not falling under the direct control of state health officials. The federal government provides funding, guidance and technical assistance to state and local planners, and can require that certain activities be carried out as a condition of funding. But the federal government has limited authority to precisely direct the planning efforts of states and localities.<sup>2</sup>

*Because the states are the seat of most authority for public health and medical preparedness, national preparedness for public health threats depends, in part, on the preparedness of individual states.* Pandemic planning at the federal, state and local levels is woven into broader “all-hazards” emergency planning, and the response to a pandemic would employ the same basic approaches to leadership, authority, coordination, assistance, and financing as with other incidents.<sup>3</sup> However, a flu pandemic would pose at least two challenges that may be unique to this threat, and that may merit specific attention in planning: the likelihood that all jurisdictions would be affected, at nearly the same time; and the potentially prolonged period—many months—during which a response posture would have to be maintained. The near-simultaneous nature of a pandemic would likely diminish the value of state-to-state mutual aid, an important tool in the response to localized incidents.<sup>4</sup> The prolonged effects of a pandemic, coupled with potentially high absenteeism, could pose exceptional challenges in maintaining continuity of operations (COOP) for essential services, including, potentially, continuity of government.<sup>5</sup>

Since 2001, all states have received annual federal funding to plan for emergencies, including public health threats. Certain planning activities were required as a condition of the federal funds. These planning requirements have evolved from one year to the next. (See the **Appendix** for information regarding federal preparedness grants to states, and associated requirements.) But efforts to evaluate states’ compliance with planning requirements, or the effectiveness of states’

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<sup>1</sup> In this report, the term “pandemic” refers to pandemic influenza.

<sup>2</sup> For more information about the nation’s public health system and public health preparedness, see CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness*, by Sarah A. Lister.

<sup>3</sup> For a discussion of these approaches in the response to public health threats in general, see CRS Report RL33579, *The Public Health and Medical Response to Disasters: Federal Authority and Funding*, by Sarah A. Lister.

<sup>4</sup> For more information about state-to-state mutual aid, see CRS Report RS21227, *The Emergency Management Assistance Compact (EMAC): An Overview*, by Keith Bea.

<sup>5</sup> See, for example, CRS Report RL32752, *Continuity of Operations (COOP) in the Executive Branch: Issues in the 109<sup>th</sup> Congress*, by R. Eric Petersen, and White House Homeland Security Council, “National Strategy for Pandemic Influenza: Implementation Plan,” Chapter 9, “Institutions: Protecting Personnel and Ensuring Continuity of Operations,” May 2006, at <http://www.pandemicflu.gov/plan/federal/index.html>.

preparedness efforts in general, have not evolved concurrently.<sup>6</sup> This CRS report describes information that exists to date regarding evaluations of pandemic preparedness. It also presents an approach to the analysis of state pandemic plans, and the findings of that analysis.

CRS analyzed pandemic plans available as of July 2006. At that point, all states had been required to submit (to the U.S. Department of Health and Human Services) pandemic plans one year earlier, and all had done so. However, the states were not given specific direction regarding the content of the plans that were required in July 2005, and they were not required to update their plans during the subsequent grant funding cycle.<sup>7</sup> Since July 2006, states have received dedicated funding for pandemic preparedness through the federal public health and hospital preparedness grants, and additional guidance, emphasizing training and exercises, has been provided. Pandemic planning benchmarks have also been incorporated in a municipal homeland security grant program.

For additional background on the variety of pandemic planning activities discussed in this report, see the following CRS Reports:

- CRS Report RL33145, *Pandemic Influenza: Domestic Preparedness Efforts*, by Sarah A. Lister;
- CRS Report RS22576, *Pandemic Influenza: Appropriations for Public Health Preparedness and Response*, by Sarah A. Lister;
- CRS Report RS22219, *The Americans with Disabilities Act (ADA) Coverage of Contagious Diseases*, by Nancy Lee Jones;
- CRS Report RL33381, *The Americans with Disabilities Act (ADA): Allocation of Scarce Medical Resources During a Pandemic*, by Nancy Lee Jones;
- CRS Report RL33201, *Federal and State Quarantine and Isolation Authority*, by Kathleen S. Swendiman and Jennifer K. Elsea;
- CRS Report RL33609, *Quarantine and Isolation: Selected Legal Issues Relating to Employment*, by Nancy Lee Jones and Jon O. Shimabukuro; and
- CRS Report RS22453, *Avian Flu Pandemic: Potential Impact of Trade Disruptions*, by Danielle Langton.

*This analysis is not intended to grade or rank individual state pandemic plans or capabilities. Rather, its findings indicate that a number of challenges remain in assuring pandemic preparedness, and suggest areas that may merit added emphasis in future planning efforts. This report will not be updated.*

## **CRS Analysis: Methods and Limitations**

In 2005, CRS retained a contractor, the National Opinion Research Center (NORC) at the University of Chicago,<sup>8</sup> to create a database that could be used to analyze state pandemic preparedness and response plans. NORC delivered the database to CRS, containing information

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<sup>6</sup> See, for example, Nicole Lurie, Jeffrey Wasserman and Christopher D. Nelson, "Public Health Preparedness: Evolution or Revolution?" *Health Affairs*, vol. 25, no. 4, pp. 935-945, July/August 2006.

<sup>7</sup> States have generally received funding for the public health and hospital preparedness grants in the summer of each year.

<sup>8</sup> See <http://www.norc.org/homepage.htm>.

abstracted from *one publicly available pandemic planning document* from each of the 50 states and the District of Columbia (DC), in August 2006.<sup>9</sup>

The most comprehensive publicly available document was used for analysis. Available documents varied, and included (1) comprehensive pandemic preparedness and response plans; (2) annexes to broader public health or emergency management plans; or (3) brief summaries of pandemic preparedness plans. Comprehensive pandemic plans were analyzed when available. When not, annexes were analyzed when available. Brief summaries were analyzed only when the other two options were not available. Broader public health or emergency management plans were not analyzed in any case. Often, they were not publicly available.

Of the 51 plans analyzed, 14 were referred to by the authoring state as draft pandemic plans, 14 as annexes to the state's all-hazards plan, and 13 as formally adopted influenza plans. Ten states did not specify.

The database was populated in July 2006. At that time, publication dates for the 51 plans ranged from 2002 through 2006, as follows:

- 2006: 29 plans;
- 2005: 16 plans, most pre-dating a key federal plan issued in November 2005;<sup>10</sup>
- 2004: 2 plans;
- 2003 and 2002: 1 plan each year; and
- Two plans were not dated.

A total of 66 variables were developed for analysis, to assess pandemic planning activities in the following eight topical areas:

- (1) Leadership and Coordination;
- (2) Surveillance and Laboratory Activities;
- (3) Vaccine Management;
- (4) Antiviral Drug Management;
- (5) Other Disease Control Activities (e.g., isolation and quarantine);
- (6) Communications Activities;
- (7) Healthcare Services; and
- (8) Other Essential Services (e.g., public utilities).

The 66 variables are *dichotomous*, that is, for each variable, plans were determined to contain substantive mention of a particular activity ("yes") or not ("no").<sup>11</sup> Variables were developed by

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<sup>9</sup> Reference in this report to "state plans" includes DC, and the total number of plans analyzed is 51. Plans analyzed were the most current publicly available plan available for each state, as of July 2006, on either the state's website, or on a federal pandemic flu website <http://www.pandemicflu.gov/plan/states/index.html>. The database was created and analyzed using Microsoft Office Access 2003 software.

<sup>10</sup> States were required to submit pandemic flu plans to the Department of Health and Human Services (HHS) by July 2005. The HHS pandemic plan for public health and medical preparedness, which included guidance for state planning, was published in November 2005, superceding a more cursory draft pandemic plan. Many states subsequently updated their plans to better coordinate with the HHS plan. See HHS, "HHS Pandemic Influenza Plan," November 2005, at <http://www.pandemicflu.gov>.

<sup>11</sup> Additional categorical and free-text variables were also created, and were used to inform analysis of the dichotomous

CRS and the contractor to span a spectrum of pandemic planning activities. They were intended to reflect a variety of public health preparedness activities that were presented in federal pandemic planning guidance documents available at the time,<sup>12</sup> as well as a number of planning challenges and potential planning gaps that were the subject of ongoing policy discussions. While each individual variable was intended to reflect an essential element of pandemic preparedness, CRS did not attempt to weigh the relative importance of each variable with respect to the others.

The findings of this analysis are subject to a number of limitations. *First*, variables were developed intentionally to reveal planning gaps, rather than to document the universe of activities that may be described in the plans, or that may have been discussed in grant guidance. (See the Appendix.) *Second*, certain planning elements (e.g., reporting relationships between the health department and the governor, or plans for mass fatality management) may not be fleshed out in the pandemic plan, but may be laid out in a state's public health preparedness or general emergency management plan. These broader plans were not analyzed, and in many cases were (and are) not publicly available.

*Third*, some states have published only brief summaries of extant pandemic plans that are not publicly available. By their nature, these summaries did not typically make substantive mention of planning activities. *Fourth*, certain preparedness and response tasks may be delegated to local officials, and may not, therefore, be described in the state pandemic plan.<sup>13</sup> *Fifth*, states may have developed detailed operational plans for certain aspects of pandemic planning (such as ventilator triage), but may not have included them in the pandemic plan, or may not have updated the pandemic plan to reflect these narrowly tailored documents.

*Sixth*, while analyses began with keyword searches, "yes" findings were applied only to substantive discussions of relevant topics in the plan, not merely the finding of a keyword in a list, or another entry that lacked meaningful context for planning. While efforts were made to standardize analysis, these determinations were inherently subjective. *Finally*, this analysis reflects a snapshot in time, in what appears to be a dynamic national planning effort. The database contains state pandemic plans available as of July 2006. Since then, FY2006 supplemental funds for state pandemic preparedness were released, pandemic planning benchmarks were included in homeland security grant guidance, and at least 16 states have updated their pandemic plans.

*Most of these limitations would have the likely effect of underestimating a state's planning efforts.* Therefore, finding that a planning element is absent from a state's pandemic plan does not necessarily mean that the state has not addressed that element.

*This analysis is not intended to grade or rank individual state pandemic plans or capabilities.* There are not, at this time, the processes or standards to support such an evaluation. Rather, this analysis is premised on the idea that national preparedness for pandemic flu is, in part, dependent upon the preparedness of individual states. Variables in this analysis that yielded fewer "yes" responses overall may indicate areas that merit added emphasis in future planning efforts.

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variables. In addition to the 66 dichotomous variables presented, selected cross-tabulations are also presented to show the interaction of certain variables.

<sup>12</sup> The set of variables was finalized in May 2006. See the Appendix for a discussion of federal guidance for state pandemic planning.

<sup>13</sup> Some local jurisdictions have published detailed pandemic plans. See, for example, Santa Clara County, California, "Pandemic Influenza Preparedness and Response Plan for Santa Clara County," at <http://www.sccphd.org/panflu>.

## Other Analyses of State Pandemic Planning

### Analyses by Federal Agencies

Though the federal government has provided considerable funding and guidance for state pandemic preparedness, it has not published a comprehensive assessment of state pandemic planning efforts. Since FY2002, all states have received grants from two agencies in the Department of Health and Human Services (HHS): the Centers for Disease Control and Prevention (CDC), to improve state and local public health capacity; and the Health Resources and Services Administration (HRSA), for hospital and healthcare system preparedness. The Department of Homeland Security (DHS) also provides preparedness grants to states and cities. A discussion of these grants, and associated federal requirements for pandemic planning, is provided in the **Appendix**. While each agency evaluates state compliance with those requirements, none has published assessments of states' performance.<sup>14</sup> The HHS Office of Inspector General has reported on the compliance of some individual states with certain requirements of the CDC and HRSA grants, but has not addressed pandemic planning specifically.<sup>15</sup> The White House Homeland Security Council has reported on federal progress to assist states in a variety of specific pandemic planning tasks laid out in the *National Strategy for Pandemic Influenza Implementation Plan* (Implementation Plan),<sup>16</sup> but has not evaluated state pandemic planning efforts.<sup>17</sup>

The Government Accountability Office (GAO) has published analyses of some aspects of federal pandemic preparedness,<sup>18</sup> but has not published a systematic analysis of state pandemic plans. GAO has also published analyses of the CDC public health and HRSA hospital preparedness grant programs, but these analyses have not included assessments of state pandemic preparedness.<sup>19</sup> GAO has not published information about the performance of individual states.

In 2006, DHS published the *Nationwide Plan Review*, the results of a comprehensive assessment of state preparedness for catastrophic events, regardless of cause.<sup>20</sup> While the review did not focus on pandemic preparedness, some of the methods used, and the findings, may nonetheless be of

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<sup>14</sup> In December 2006, the Associated Press reported that HHS planned an evaluation of state pandemic preparedness, to be completed in spring 2007, based on a questionnaire that would "go beyond health care to ask how communities would keep the economy and society in general running." Lauran Neergaard, "State Preparations for Pandemic Vary Widely," *Associated Press*, December 16, 2006.

<sup>15</sup> See HHS, Office of Inspector General, reports on the HRSA Bioterrorism Hospital Preparedness Program, and the CDC Public Health Preparedness and Response for Bioterrorism Program, at <http://oig.hhs.gov/reports.html>.

<sup>16</sup> White House Homeland Security Council, "National Strategy for Pandemic Influenza: Implementation Plan," May 2006, at <http://www.pandemicflu.gov/plan/federal/index.html>.

<sup>17</sup> See White House Homeland Security Council, summary of progress on actions to be completed within 12 months of the release of the "National Strategy for Pandemic Influenza Implementation Plan," July 2007, at <http://www.pandemicflu.gov/plan/federal/summaryprogress2007.html>.

<sup>18</sup> See, for example, GAO: "Influenza Pandemic: Further Efforts Are Needed to Ensure Clearer Federal Leadership Roles and Effective National Strategy," GAO-07-781, August 14, 2007; "Influenza Pandemic: Efforts to Forestall Onset Are Under Way; Identifying Countries at Greatest Risk Entails Challenges," GAO-07-604, June 20, 2007; and "Avian Influenza: USDA Has Taken Important Steps to Prepare for Outbreaks, but Better Planning Could Improve Response," GAO-07-652, June 11, 2007.

<sup>19</sup> See, for example, GAO, "Public Health and Hospital Emergency Preparedness Programs: Evolution of Performance Measurement Systems to Measure Progress," GAO-07-485R, March 23, 2007.

<sup>20</sup> See DHS, "Nationwide Plan Review, Phase 2 Report," June 16, 2006, at <http://www.dhs.gov/xprepresp/programs/>, hereinafter DHS Nationwide Plan Review.

interest. DHS conducted its review in two phases: state self-assessments and validation site visits, conducted by teams of peer reviewers.<sup>21</sup> States were evaluated for a variety of benchmarks, and their planning status was graded as *fully*, *partially*, or *not sufficient*. Review teams focused on three health and medical benchmarks: (1) processes to maintain a patient tracking system; (2) procedures to license out-of-state medical volunteers; and (3) processes for mass fatality management. They found fewer than half of the states to be fully sufficient for each benchmark.<sup>22</sup> Results were published in aggregate (i.e., DHS did not publish the results for specific states).

## **Analyses by Nongovernmental Authors**

Researchers from Research Triangle Institute International (RTI) published the findings of their analysis of 49 state pandemic plans, available as of early 2006, for planning elements including vaccination, surveillance and detection, and disease containment.<sup>23</sup> The authors found considerable variation among states, and posited two explanations: first, federalism, which places states in the lead in matters of public health; and second, limited scientific information about how flu is spread, and, therefore, which disease control practices are likely to be effective. The authors recommended that HHS publish more detailed planning guidance for states, and that there be more research on influenza, including the effect of interventions—such as use of masks and closure of schools—on disease transmission. Authors presented their findings for specific states for ten specific preparedness benchmarks, and published the findings for additional benchmarks in aggregate.

Trust for America's Health (TFAH), a not-for-profit public health advocacy group, has published annual "report cards" in which states were graded according to a set of preparedness criteria developed by the group.<sup>24</sup> As with prior reports, the 2006 report included primarily general—not pandemic-specific—public health criteria, but included a finding that four states do not test year-round for the flu, which is necessary to monitor for a pandemic outbreak. TFAH also created a model to assess potential economic losses caused by a severe pandemic, including state-by-state effects, and effects on 20 different industries, and on trade and worker productivity.<sup>25</sup> The model predicted that states with high levels of tourism and entertainment would be the hardest hit by the economic effects. Both reports included findings for specific states.

In December 2006, the Associated Press (AP) reported on the findings of interviews it conducted with health officials in every state regarding aspects of pandemic planning.<sup>26</sup> AP found that many states had not yet made investments of state funds for pandemic planning, but were reliant solely on federal funds. Health officials stressed that during a pandemic, shortages of healthcare workers would likely be the worst bottleneck in ramping up health system capacity. AP also found a lack

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<sup>21</sup> States were to assess their preparedness according to FEMA's "State and Local Guide (SLG) 101: Guide for All-Hazard Emergency Operations Planning," September 1996, at <http://www.fema.gov/pdf/plan/slg101.pdf>.

<sup>22</sup> DHS Nationwide Plan Review, pp. 27-28.

<sup>23</sup> Holmberg, S.D., Layton, C.M., Ghneim, G.S., and Wagener, D.K., "State Plans for Containment of Pandemic Influenza," *Emerging Infectious Diseases*, September 2006, at <http://www.cdc.gov/ncidod/EID/vol12no09/06-0369.htm>, hereinafter referred to as Holmberg et al.

<sup>24</sup> Trust for America's Health, "Ready or Not? Protecting the Public's Health from Disease, Disasters, and Bioterrorism, 2006," December 2006, available, along with comparable reports for 2003, 2004 and 2005, at <http://healthyamericans.org/reports/bioterror06/>.

<sup>25</sup> Trust for America's Health, "Pandemic Flu and Potential for U.S. Economic Recession," March 2007, at <http://healthyamericans.org/reports/flurecession/>.

<sup>26</sup> Lauran Neergaard, "State Preparations for Pandemic Vary Widely," *Associated Press*, December 16, 2006.

of consensus on some planning elements, such as whether to close schools, or to stockpile antiviral drugs.

## CRS Analysis: Results

The following sections tabulate and discuss findings for the 66 dichotomous variables. Findings of “yes” mean that a state pandemic plan makes substantive mention of the relevant subject matter. For each of the variables, 51 plans were analyzed. Tables are presented for each of eight topical areas studied. For most of the topical areas, plans were searched for *planning assumptions*. These are statements of generally accepted facts or circumstances that are used to achieve consistency and relevance in planning efforts, such as the assumption that a severe pandemic could result in absenteeism rates as high as 40%. Overarching planning assumptions for pandemic flu are provided in the HHS Pandemic Plan, and include the universal and near-simultaneous nature of a pandemic, and the expectation of shortages of vaccine and antiviral drugs.<sup>27</sup> In this analysis, state plans were searched for the presence of planning assumptions that were specific to the topical area being analyzed.

### Leadership and Coordination

Often when emergency managers have reviewed the response to disasters, they have found the most serious shortcomings to involve unclear lines of authority, confusion about leadership, lack of mechanisms to coordinate multiple responding agencies, and other problems involving “command and control.” In the 1970s, firefighters developed the *Incident Command System* (ICS) to address these problems in the management of rapidly moving wildfires. Since then, the nation’s structures for coordinated incident response have evolved, incorporating lessons learned from a number of disasters and terrorist attacks. In 2002, Congress established DHS to serve as the focal point for the federal government’s disaster preparedness and response activities, and tasked the Secretary of DHS to develop the *National Incident Management System* (NIMS), to assure that responders from different jurisdictions and disciplines can work together effectively in disaster response. In addition, Congress has continued to refine the delegations of authority among key federal response agencies.<sup>28</sup> State response agencies have evolved similarly, and are in some cases required to adopt uniform emergency management practices as a condition of federal homeland security grant funding.

**Table 1** presents the findings of this analysis for state designations of authority and coordinating mechanisms in the response to a flu pandemic. Generally, fewer than half of the plans made substantive mention of each of the leadership and coordination variables, such as the designation of specific responsible individuals or liaisons. About two-thirds of the plans mentioned the state’s Emergency Operations Center and how it would be activated to coordinate response efforts during a pandemic.<sup>29</sup>

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<sup>27</sup> HHS Pandemic Plan, Executive Summary, p. 5.

<sup>28</sup> See CRS Report RL33729, *Federal Emergency Management Policy Changes After Hurricane Katrina: A Summary of Statutory Provisions*, by Keith Bea et al., and CRS Report RL33579, *The Public Health and Medical Response to Disasters: Federal Authority and Funding*, by Sarah A. Lister. For more information about NIMS, see <http://www.fema.gov/emergency/nims/index.shtm>.

<sup>29</sup> An Emergency Operations Center is the physical location where agency representatives assemble during an emergency to coordinate response and recovery actions and resources.

**Table 1. Leadership and Coordination**

Leadership and Coordination Variable	No. of plans that address variable (N=51)
Provides general planning assumptions regarding pandemic flu	34
Designates a liaison between Health Department (HD) and Governor	10
Designates a liaison between HD and State Emergency Management Office	13
Designates an individual with authority to declare a public health emergency <sup>a</sup>	23
Mentions the National Incident Management System (NIMS)	16
Mentions role of the National Guard	16
Mentions NIMS <i>and</i> the National Guard	4
Mentions the State Emergency Operations Center (SEOC)	33
HD is represented in the SEOC	11
Healthcare system liaison is represented in the SEOC	6
Mentions pandemic flu exercises or drills	37

a. The designated individual is usually either the Governor or the State Health Official.

Only 16 of the plans mentioned the National Incident Management System (NIMS), though states were to address NIMS compliance as a requirement for FY2005 federal preparedness funds, made available in the spring of 2005.<sup>30</sup> Also, only 16 plans mentioned a possible role for the National Guard in pandemic response. Unless it is federalized, the National Guard is a state response asset under the control of the Governor.<sup>31</sup> There has been considerable discussion of the maintenance of civil order during a pandemic. While matters of incident management or deployment of the National Guard may be described in the state's general preparedness plan, a flu pandemic could have certain effects that are unlike other disasters. Hence, it could be helpful to describe specifically how the National Guard might be used, or how incident command could be established, during a pandemic. Only four state plans mentioned *both* NIMS and the National Guard.

About three-fourths of the plans mentioned pandemic flu exercises or drills. States were required to conduct public health emergency response exercises, and to develop pandemic plans, as conditions of their FY2005 CDC public health grants, but they were not required, at that time, to conduct exercises specifically for a flu pandemic. As a requirement of FY2006 supplemental appropriations for pandemic flu, Congress called on the states to conduct pandemic flu exercises that would "enable public health and law enforcement officials to establish procedures and locations for quarantine, surge capacity, diagnostics, and communication."<sup>32</sup> CDC guidance

<sup>30</sup> See, for example, the announcement accompanying FY2005 guidance for the CDC public health grants to states, May 2005, pp 13-14, at <http://www.bt.cdc.gov/planning/coopagreement/>.

<sup>31</sup> For more information, see CRS Report RS22266, *The Use of Federal Troops for Disaster Assistance: Legal Issues*, by Jennifer K. Elsea and R. Chuck Mason.

<sup>32</sup> H.Rept. 109-359, to accompany H.R. 2863, Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act, 2006, p. 523. See the Appendix for more information.

accompanying the grants required states to test three aspects of pandemic response: control of community gatherings (e.g., school closings); medical surge capacity; and mass vaccination / mass prophylaxis.<sup>33</sup> The funds were made available to states in July 2006, the same time that the CRS pandemic plan database was constructed. While the requirement for multi-sector exercises by states is important, these exercises may be carried out individually by states. The only national multi-sector pandemic exercise reported to date has been a table-top simulation conducted by members of the Cabinet.<sup>34</sup>

## Surveillance and Laboratory Activities

The CDC coordinates domestic surveillance for seasonal flu in people. State and local health departments and designated healthcare providers voluntarily report relevant information, such as laboratory results or hospital admissions, to several flu surveillance systems run by CDC. Information is gathered and analyzed weekly during the winter flu season. Monitoring for pandemic flu would be integrated into these existing systems. Key challenges in the rapid detection of novel flu viruses (i.e., those with “pandemic potential”) are the vagueness of flu symptoms, which occur with many other diseases, and the difficulty in distinguishing specific flu strains of interest from the background of other strains commonly in circulation.<sup>35</sup>

**Table 2** presents the findings of this analysis for state surveillance and laboratory activities in pandemic planning. Twenty-seven plans mentioned laboratory-based surveillance for flu-like illness. However, many of the plans pre-date 2006, when CDC reported that public health labs in all 50 states and the District of Columbia have the capability to test for H5N1 influenza.<sup>36</sup> Most state plans incorporated planning assumptions to guide flu surveillance. However, most state plans did not mention integration of human and animal flu surveillance data, or the use of “syndromic surveillance” to track flu.<sup>37</sup>

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<sup>33</sup> CDC, “Pandemic Influenza Guidance Supplement: Phase 2,” guidance for FY2006 funds, July 10, 2006, at <http://www.bt.cdc.gov/planning/coopagreement/>.

<sup>34</sup> White House, “Press Gaggle after Avian Flu Tabletop Exercise with Homeland Security Advisor Fran Townsend, Secretary of Health and Human Services Michael Leavitt, and Secretary of Homeland Security Michael Chertoff,” transcript, December 10, 2005, at <http://www.whitehouse.gov/news/releases/2005/12/20051210-2.html>. CDC has a comprehensive internal pandemic response plan, and has also conducted a series of internal pandemic preparedness exercises. See CDC podcast on pandemic preparedness, April 25, 2007, at <http://www2a.cdc.gov/podcasts/index.asp>, and CDC, “Influenza Pandemic Operation Plan”(OPLAN), March 20, 2007, at <http://www.cdc.gov/flu/pandemic/pdf/20MarchOPLAN.pdf>.

<sup>35</sup> CDC, “Overview of Influenza Surveillance in the United States,” June 26, 2006, at <http://www.cdc.gov/flu/weekly/pdf/flu-surveillance-overview.pdf>.

<sup>36</sup> An H5N1 influenza diagnostic test, developed by CDC, was approved by the Food and Drug Administration (FDA) and delivered to laboratories in the national Laboratory Response Network, which includes public health labs in all 50 states, many federal labs, and others, in February 2006. See <http://www.bt.cdc.gov/lrn/factsheet.asp>.

<sup>37</sup> “Syndromic surveillance” means tracking symptoms of illness, which could provide information faster than waiting for the results of laboratory testing. CDC’s surveillance of sentinel healthcare providers gathers reports of “influenza-like illness” (ILI), which is a form of syndromic surveillance. Some have recommended that during a pandemic, states should be able to expand surveillance of ILI to emergency departments and other healthcare facilities.

**Table 2. Surveillance and Laboratory Activities**

<b>Surveillance and Laboratory Activities Variable</b>	<b>No. of plans that address variable (N=51)</b>
Provides planning assumptions regarding surveillance	40
Mentions capacity to perform lab-based surveillance for flu-like illness	27
Mentions linkage of human and animal flu surveillance data	19
Mentions (existing or planned) use of syndromic surveillance to track flu	23

A previously published analysis of 49 state pandemic plans found that there was considerable variation among states in planning for surveillance and detection; all states planned to utilize some or all of the existing flu surveillance mechanisms during a pandemic; and few state plans mentioned procedures to screen arriving international travelers for influenza.<sup>38</sup>

## Vaccine Management

Vaccination is considered the best preventive measure for influenza. But, because of continuous changes in the genes of flu viruses, vaccines must be “matched” to specific strains to provide good protection. Flu vaccine is currently produced using a time-consuming process with a six-month lead time. In the early months of a pandemic, vaccine would be in short supply. Policymakers have struggled to develop the best approaches for vaccine rationing when there are competing goals: maximizing lives saved, assuring the continuity of essential services, and maintaining perceptions of fairness, for example.<sup>39</sup>

**Table 3** presents the findings of this analysis for variables regarding vaccine management before and during a pandemic.

**Table 3. Vaccine Management**

<b>Vaccine Management Variable</b>	<b>No. of plans that address variable (N=51)</b>
Provides planning assumptions regarding vaccine management	28
Identifies priority groups	33
Identifies and enumerates priority groups	6
Describes plan for vaccine distribution	36
Describes multiple contingency plans for vaccine distribution	12
Describes plan for vaccine storage	20
Describes plan for vaccine security	17
Describes plan to implement Investigational New Drug (IND) protocol	15
Describes plan to track dose parity (first or second dose for an individual)	13

<sup>38</sup> Holmberg et al.

<sup>39</sup> See CRS Report RL33381, *The Americans with Disabilities Act (ADA): Allocation of Scarce Medical Resources During a Pandemic*, by Nancy Lee Jones.

<b>Vaccine Management Variable</b>	<b>No. of plans that address variable (N=51)</b>
Describes plan to track vaccine-associated adverse events (VAEs)	34
Describes plan for IND protocol <i>and</i> tracking vaccine parity <i>and</i> VAEs	6
Delegates aspects of vaccine management and logistics to local HD	8

While about two-thirds of the state plans discussed the matter of priority groups, only six attempted to enumerate the individuals in each group. Enumerating those in priority groups (i.e., knowing how many of a state's residents fall within each of the priority groups) is essential in executing a state's priority plan. Without that information, it would not be possible to match the magnitude of need to the actual number of doses of vaccine available, and to properly advise officials and the public regarding who should report for, request, or be given vaccination at specific points in time.

This analysis did not attempt to describe vaccine priority schemes for those states that proposed them. A previously published analysis of state pandemic plans found that most states planned to comport with vaccine priority guidelines laid out in the HHS Pandemic Plan<sup>40</sup> (if the state plan was published after the HHS plan), or with earlier federal recommendations.<sup>41</sup> In general, these federal recommendations call for healthcare workers, and sometimes other first responders, to be vaccinated first, in order that they can remain at work and not make others ill. Next in order of priority are those most vulnerable to serious complications from flu, based on annual experience with seasonal flu. Some have criticized this approach, saying that it fails to address other legitimate planning goals, such as the continuity of essential services, vaccination of populations that are most likely to spread flu, or the apparent poor immune response to the vaccine among some individuals in vulnerable priority groups.<sup>42</sup> A 2006 analysis of pandemic plans from 45 countries found marked variability in proposed vaccine priority schemes, in particular with respect to the priority ranking assigned to children, further demonstrating the lack of scientific and cultural consensus on this matter.<sup>43</sup>

While about three-fourths of state plans discussed vaccine procurement and distribution, 12 states appear to have kept their options open, and have planned to distribute vaccine, or coordinate its distribution, according to several different possible procurement scenarios. Fewer than half of the state plans discussed vaccine storage or security.

States' efforts to plan for vaccine procurement and distribution during a pandemic may have been complicated by uncertainty about the ways in which vaccine may be made available to states. To date, efforts to develop and stockpile candidate *pre-pandemic* (unmatched prototype) vaccines have been federally funded, and the vaccines are not commercially available. But it is not clear that the federal government would purchase matched vaccine during a pandemic. While having

<sup>40</sup> HHS Pandemic Plan, Part 1, Appendix D, "NVAC/ACIP Recommendations for Prioritization of Pandemic Influenza Vaccine and NVAC Recommendations on Pandemic Antiviral Drug Use," beginning on p. 59 of the pdf document.

<sup>41</sup> Holmberg et al.

<sup>42</sup> See, for example, Ezekiel J. Emanuel and Alan Wertheimer, "Who Should Get Influenza Vaccine When Not All Can?" *Science*, vol. 312, pp. 854-855, May 12, 2006.

<sup>43</sup> L. Uscher-Pines et al., "Priority Setting for Pandemic Influenza: An Analysis of National Preparedness Plans," *PLoS Medicine*, vol. 3, no. 10, October 17, 2006. The study also found variability among countries in their plans to prioritize the use of antiviral drugs.

centralized control could simplify planning efforts, it could also carry significant cost for the federal government unless it were possible to use collateral financing sources—such as Medicare and private health insurance—when available to pay for the vaccine. The HHS Pandemic Plan states that during a pandemic, vaccine would be made available through existing commercial channels and distribution mechanisms.<sup>44</sup> This is the same system that has come under fire during recent shortages of seasonal flu vaccine, because of the difficulties faced by public health officials in trying to locate and redirect available vaccine to priority groups. In 2006, Congress passed the Pandemic and All-Hazards Preparedness Act (P.L. 109-417), which authorizes the Secretary of HHS, with the voluntary cooperation of manufacturers, wholesalers, and distributors, to track the initial distribution of federally purchased flu vaccine during a pandemic.<sup>45</sup>

If a pandemic were to spread swiftly, vaccine may be pressed into service before standard safety and efficacy tests could be completed. Such unlicensed vaccine could be used under the Food and Drug Administration's (FDA's) Investigational New Drug (IND) provisions.<sup>46</sup> These include requirements for strict inventory control, record keeping, informed consent, and adverse event tracking, all of which would pose an additional challenge for public health officials during a vaccination campaign. In addition, two doses of a pandemic flu vaccine may be needed to provide optimal protection. Consequently, an individual's "vaccine parity"—whether he or she has received no vaccine, one dose, or two doses—is vital information to assure the effective use of this finite resource within a population. As shown in **Table 3**, while two-thirds of state plans discussed vaccine adverse event tracking, most did not address the conduct of IND protocols or tracking of vaccine parity, and only six plans discussed all three planning elements.

Eight state plans made explicit mention that planning for vaccine management was delegated to local health departments. As with emergency response in general, local authorities would be responsible for carrying out most of the actual operations in a vaccination campaign, so coordination between state pandemic plans and local efforts is critical.

## Antiviral Drug Management

Since "matched" pandemic flu vaccine would be unavailable in the early stages of a pandemic, governments and private parties have been interested in drugs that could treat or prevent serious illness from flu. The federal government has set a goal to stockpile antiviral medications adequate to treat 75 million persons (one-fourth of the population), divided between federal and state stockpiles.<sup>47</sup> States were expected to procure 31 million of the 75 million treatment courses, for which HHS would reimburse 25% of the cost. A May 2007 survey of state health officials found that 24 of them did not yet have sufficient funding from other sources to purchase the planned amounts of antiviral drugs.<sup>48</sup>

**Table 4** presents the findings of this analysis for states' management of antiviral drugs before and during a pandemic. Many of the variables—such as the designation and enumeration of

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<sup>44</sup> HHS Pandemic Plan, "Vaccine Production, Procurement and Distribution," p. S6-6 (p. 278 of the pdf document).

<sup>45</sup> See CRS Report RL33589, *The Pandemic and All-Hazards Preparedness Act (P.L. 109-417): Provisions and Changes to Preexisting Law*, by Sarah A. Lister and Frank Gottron.

<sup>46</sup> 21 C.F.R. 312.

<sup>47</sup> White House Homeland Security Council, "The National Strategy for Pandemic Influenza," p. 9. November 1, 2005, at <http://www.pandemicflu.gov/plan/federal/index.html>.

<sup>48</sup> Association of State and Territorial Health Officials, (ASTHO), "ASTHO Antiviral Survey Summary," May 2007, at <http://www.astho.org/pubs/April07AntiviralSurveyResults051607.pdf>. Respondents included officials from all 50 states, the District of Columbia, and one territory. A baseline survey from October 2006 is at <http://www.astho.org/pubs/AntiviralSurvey121806.pdf>.

priority groups, and plans for distribution and security—are similar to those developed to analyze vaccine management.

**Table 4. Antiviral Drug Management**

<b>Antiviral Drug Management Variable</b>	<b>No. of plans that address variable (N=51)</b>
Provides planning assumptions regarding antiviral drug management	28
Priority groups identified	29
Priority groups specific for antiviral drugs	14
Priority groups same as for vaccine	15
Priority groups identified and enumerated	7
Describes plan for antiviral drug distribution	37
Distribution plan is specific for antiviral drugs	26
Distribution plan is same as for vaccine	11
Describes plan for drug storage	8
Describes plan for drug security	12
Creates a database or other antiviral drug tracking mechanism	17
Describes plan to implement Investigational New Drug (IND) protocol	8
Describes plan to track drug-associated adverse events	25
Describes plan for IND protocol and VAEs	6

In designating priority groups for antiviral drugs, HHS has proposed a slightly different scheme than that for vaccines, beginning with treatment for those who are admitted to hospitals with severe illness from flu.<sup>49</sup> Priority categories are otherwise fairly similar to those for vaccine. While 29 state plans addressed priorities for antiviral drugs, only seven enumerated the priority groups.

Almost three-fourths of the state plans discussed plans for antiviral drug distribution, though fewer than half of them discussed plans for storage, security, or tracking.

If unlicensed antiviral drugs were used under emergency authorities during a pandemic, their use would require Investigational New Drug (IND) protocols, including adverse event tracking, as discussed earlier with respect to vaccines. Most state plans did not address the implementation of IND protocols for unlicensed antiviral drugs, but about half of the plans did mention adverse event tracking, which could be useful whether the drugs used are licensed or unlicensed.

## Other Disease Control Activities

In the United States, isolation and quarantine authority is generally based in state rather than federal law.<sup>50</sup> While isolation and quarantine were crucial in the worldwide response to SARS,

<sup>49</sup> HHS Pandemic Plan, Part 1, Appendix D, “NVAC/ACIP Recommendations for Prioritization of Pandemic Influenza Vaccine and NVAC Recommendations on Pandemic Antiviral Drug Use,” beginning on p. 59 of the pdf document.

<sup>50</sup> Both isolation and quarantine restrict the movement of those affected, but they differ depending on whether an

these methods are less likely to be successful in controlling influenza. Influenza has a shorter incubation period than SARS, and is often contagious in the absence of symptoms or before symptoms appear, making it difficult to identify persons who should be quarantined. **Table 5** presents the findings of this analysis regarding the use of isolation, quarantine, and other so-called *non-pharmaceutical interventions* (NPI, i.e., interventions not involving drugs or vaccines) during a pandemic.

**Table 5. Other Disease Control Activities**

Other Disease Control Activities Variable	No. of plans that address variable (N=51)
Describes procedures for isolation and quarantine	29
Identifies locations for isolation and quarantine	9
Identifies individual(s) with authority to compel isolation and quarantine	21
Describes procedures for judicial review of due process protections	2
Describes plans for “snow days” or other social distancing measures	16

More than half of the plans discussed isolation and quarantine procedures whether voluntary or compulsory. Twenty one plans identified the state official who has authority to compel isolation and quarantine, though only two discussed the use of judicial review to assure the protection of civil liberties if such orders were made. Whether this signals a gap in state legal preparedness for public health threats, skepticism about the utility of constraining individual movement to limit the spread of pandemic flu, or other factors, cannot be determined from this analysis. Since the 2001 terrorist attacks, states have been active in revising their public health authorities, though the scope of authorities regarding disease control still varies from state to state.<sup>51</sup>

Only nine plans discussed designated locations in which isolation and quarantine could be carried out, and for several of them, “home” was the designated location. This comports with the planning assumption that the healthcare workforce could be overwhelmed during a pandemic of even modest severity. Those who were sufficiently ill could receive care, under feasible isolation protocols, within healthcare facilities. (These may include *alternate* facilities, which are discussed later in the section on healthcare services.) Those who were exposed but not ill, or who were mildly ill, would remain at home, receiving care from family and friends. Few plans discussed the use of large, congregate isolation or quarantine facilities for pandemic flu.

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individual has been exposed to a disease (quarantine), or is actually infected (isolation). Persons in isolation may be ill, and isolation sometimes occurs in healthcare settings. Those under quarantine are, by definition, not ill from the disease in question, though other health conditions may complicate the quarantine process. For more information, see CRS Report RL33201, *Federal and State Quarantine and Isolation Authority*, by Kathleen S. Swendiman and Jennifer K. Elsea.

<sup>51</sup> See status reports of two projects developed to assist states in revising their public health laws: the Model State Emergency Health Powers Act, developed by the Center for Law and the Public’s Health; and the Turning Point Model State Public Health Act, funded by the Robert Wood Johnson Foundation, both at <http://www.publichealthlaw.net/Resources/Modellaws.htm>. For more information about state emergency management and homeland security authorities, see CRS Report RL32287, *Emergency Management and Homeland Security Statutory Authorities in the States, District of Columbia, and Insular Areas: A Summary*, by Keith Bea, L. Cheryl Runyon, and Kae M. Warnock, in particular Table 1, listing individual state profiles and accompanying CRS report numbers.

Fewer than one-third of the plans provided substantive descriptions of large-scale social distancing measures. Such measures include so-called “snow days,” in which communities would close schools, cease non-essential operations, and enact other protocols that would have the effect of keeping people at home. In February 2007, after the creation of the CRS database, CDC published a planning guide for the phased use of interventions not involving drugs or vaccines, including isolation and quarantine, school closures, liberal work leave policies, and teleworking strategies.<sup>52</sup>

## Communications Activities

Since FY2002, states have been required to develop plans for public health emergency risk communication (i.e., communication to the public). A flu pandemic would likely affect jurisdictions throughout the United States, though timing, severity, and other aspects of the outbreak could vary considerably. That complicates the delivery of a unified message. Public confidence could erode if neighboring jurisdictions recommended different approaches to school and business closures, though each jurisdiction’s decision may be sound. Successful management of a pandemic would require public cooperation, especially if resources of various kinds were to become scarce. The HHS Pandemic Plan notes that effective risk communication during a pandemic could, among other things, help set realistic public expectations of the healthcare system, and promptly address rumors, inaccuracies and misperceptions.<sup>53</sup> States can offer considerable assistance to localities in managing public communication, such as maintaining a common website, and making experts and spokespersons available. **Table 6** presents the findings of this analysis regarding public communications during a pandemic.

**Table 6. Communications Activities**

<b>Communications Variable</b>	<b>No. of plans that address variable (N=51)</b>
Provides planning assumptions regarding public communication	26
Designates a lead public information officer	34
Describes training or outreach to emergency response groups	17
Describes plan to monitor information from WHO, CDC, other official sources	30
Mentions websites, hotlines or other public information resources	30
Mentions individual / family preparedness	20

About two-thirds of the plans designated the individual who would serve as the lead public information official. In most cases in which it could be determined, the designated individual was an employee of the state health department. Some plans mentioned the creation of a joint communications function (consistent with the National Incident Management System), in which the health department communications official would report to another public information officer,

<sup>52</sup> CDC, “Interim Pre-pandemic Planning Guidance: Community Strategy for Pandemic Influenza Mitigation in the United States—Early Targeted Layered Use of Non-Pharmaceutical Interventions,” February 2007, at <http://www.pandemicflu.gov/>.

<sup>53</sup> HHS Pandemic Plan, Part 2, “Public Health Communications,” p. S10-1 ff. (p. 359-396 of the pdf document).

who would lead the state’s multi-sector response.<sup>54</sup> Plans did not always explicitly address other aspects of public communication during a pandemic, namely: training and outreach to other responders; monitoring of information from official sources; maintenance of websites and other public information resources; or individual and family preparedness.

## Healthcare Services

There is a growing concern that medical surge capacity could be the Achilles’ heel of pandemic preparedness.<sup>55</sup> To contain costs, much of the nation’s healthcare system functions at full capacity under normal conditions, and relies on a “just-in-time” supply chain. The healthcare sector is also largely under private ownership, generally beyond the purview, and often beyond the expertise, of the public health officials who lead pandemic preparedness efforts. Though there are federal and state efforts to stockpile vaccines, drugs, ventilators, and other supplies, the healthcare workforce is likely to be the key limiting factor in ramping up healthcare service delivery during a pandemic.

An influenza pandemic of even limited magnitude has the potential to disrupt the normal workings of the healthcare system in a variety of ways. These may include deferral of elective medical procedures; diversion of patients away from overwhelmed hospital emergency departments and tertiary care facilities; protective quarantines of susceptible populations such as residents of long-term care facilities; and hoarding, theft or black-marketeering of scarce resources such as vaccines or antiviral drugs. The system’s usual approaches to mass casualty management involve bringing in additional workers from other states, and diverting or evacuating patients to unaffected facilities. Because flu is a communicable disease, and because a pandemic could affect large areas of the United States simultaneously, these approaches may be ineffective, or even harmful, during a pandemic.

Options to expand healthcare capacity during a pandemic include stockpiling supplies beforehand (with considerable up-front cost), and *altering standards of care*, that is, implementing policies that change the way medicine is practiced. Approaches to altered standards of care include providing healthcare at alternate sites, such as gymnasiums; changing required staffing ratios; altering scopes of practice (e.g., permitting a nurse to perform certain procedures that normally could only be performed by a physician); withholding of certain services, such as diagnostic tests; and rationing of services. **Table 7** presents the findings of this analysis for variables regarding the provision of healthcare services during a pandemic.

**Table 7. Healthcare Services**

Healthcare Services Variable	No. of plans that address variable (N=51)
Mentions planning assumptions regarding healthcare services	26
Mentions deployment of the Strategic National Stockpile	35
Mentions stockpiling of routine drugs and supplies	22

<sup>54</sup> See, for example, the Virginia Department of Health’s coordinated public information activities, including integration into the state’s on-scene Joint Information Center (JIC), in response to the Virginia Tech shootings in April 2007, at <http://www.astho.org/newsletter/newsletters/9/index.html>.

<sup>55</sup> For more information on issues associated with medical surge capacity, see HHS, “Mass Medical Care with Scarce Resources: A Community Planning Guide,” February 2007, at <http://www.ahrq.gov/research/mce/>.

Healthcare Services Variable	No. of plans that address variable (N=51)
Mentions stockpiling of antiviral drugs	20
Mentions procurement of medical supplies during a pandemic	19
Mentions plan for medical surge capacity	22
Mentions plan for health workforce surge capacity	10
Mentions alternate care sites	20
Mentions plan for altered standards of care	8
Mentions plan to monitor utilization and capacity (e.g., hospital beds)	7
Mentions plan for psycho-social support / mental health services for citizens	29
Mentions psycho-social support / mental health services for responders	18
Mentions mass fatality management	17

Most state plans discussed deployment of the Strategic National Stockpile (SNS), a civilian stockpile of drugs and supplies maintained by CDC for distribution to state officials during emergencies.<sup>56</sup> States were required to plan and exercise for receipt and distribution of SNS contents as a condition of their public health preparedness grants. This mechanism may be used to distribute vaccines and/or antiviral drugs during a pandemic. But the federal stockpile could not contain the amounts and variety of drugs and medical supplies needed to sustain general healthcare services across the nation during a pandemic. Fewer than half of state plans discussed state or local stockpiling of drugs and supplies, or their procurement during a pandemic in the event that supply chains were disrupted.

Fewer than half of state plans discussed each of several other approaches to expand healthcare capacity during a pandemic, including plans for: medical surge capacity in general; health workforce surge capacity; the use of alternate healthcare sites; altering standards of care; and tracking of capacity and utilization.<sup>57</sup>

While slightly more than half of the plans discussed providing for the mental health and psycho-social support needs of citizens, only about one-third of plans addressed this planning element specifically for responders.

Also, only one-third of the plans mentioned the management of mass fatalities. According to the HHS Pandemic Plan, a moderate pandemic could result in an estimated 209,000

<sup>56</sup> See CDC, Strategic National Stockpile overview, at <http://www.bt.cdc.gov/stockpile/>.

<sup>57</sup> Some states have created work groups to address specific aspects of surge capacity during a pandemic, such as rationing schemes for ventilators. See, for example, John L. Hick and Daniel T. O’Laughlin, “Concept of Operations for Triage of Mechanical Ventilation in an Epidemic,” *Academic Emergency Medicine*, vol. 13, no. 2, pp. 223-229, published online January 6, 2006, at <http://www.aemj.org/cgi/content/abstract/13/2/223>; and New York State Department of Health, “New York State Health Department Releases Ventilator Allocation Guidelines for Comment,” press release, March 16, 2007, at [http://www.health.state.ny.us/press/releases/2007/2007-03-16 Ventilator\\_allocation.htm](http://www.health.state.ny.us/press/releases/2007/2007-03-16 Ventilator_allocation.htm).

deaths nationwide, and a severe pandemic, like that in 1918, could result in an estimated 1.9 million deaths.<sup>58</sup>

## Other Essential Services

A severe pandemic could cause high absenteeism, with disruption of essential services, supply chains, and other consequences beyond the public health and healthcare sectors. The Secretary of HHS, Michael Leavitt, has said, “If a pandemic hits our shores, it will affect almost every sector of our society, not just health care, but transportation systems, workplaces, schools, public safety and more. It will require a coordinated government-wide response, including federal, state and local governments, and it will require the private sector and all of us as individuals to be ready.”<sup>59</sup>

Following release of the National Strategy and the HHS Pandemic Plan in November 2005, HHS Secretary Michael Leavitt and other federal officials hosted pandemic planning summits in all 50 states, to support states’ multi-sector planning activities. In July 2006, the National Governors Association, Center for Best Practices, developed a pandemic planning guide for governors and senior state officials,<sup>60</sup> and, in April 2007, launched a series of regional workshops to examine state pandemic planning in a number of non-health areas.<sup>61</sup> The workshops were designed to help governors’ staff and state agencies examine issues such as governance; maintenance of essential services; and the coordination of response strategies among levels of government and across borders during a pandemic.

**Table 8** presents the findings of this analysis regarding the continuity of services other than public health and healthcare services, during and after a pandemic. Findings show that few state plans mentioned other essential services during a pandemic, including planning assumptions for the continuity of essential services; emergency food distribution; the continuity of essential services, including public utilities; and the re-establishment of routine functions, such as schools and businesses, as a pandemic recedes.

**Table 8. Other Essential Services**

Other Essential Services Variable	No. of plans that address variable (N=51)
Provides planning assumptions regarding continuity of essential services	11
Mentions plan for emergency food distribution	9
Mentions plan for continuity of essential services (including public utilities)	7
Mentions plan to re-establish schools and businesses as pandemic recedes	4

<sup>58</sup> HHS Pandemic Plan, p. 18.

<sup>59</sup> Remarks of HHS Secretary Michael Leavitt on “Avian Flu,” National Press Club, October 27, 2005, CQ Transcriptions.

<sup>60</sup> National Governors Association, Center for Best Practices, “Preparing for a Pandemic Influenza: A Primer for Governors and Senior State Officials,” July 2006, at <http://www.nga.org/Files/pdf/0607PANDEMICPRIMER.PDF>.

<sup>61</sup> National Governors Association, “NGA Center Launches Pandemic Outbreak Workshops to Enhance State Readiness,” press release, April 10, 2007, at <http://www.nga.org/portal/site/nga>.

## Conclusions and Remaining Issues

The variables reported in this analysis were developed to reflect common concerns in pandemic flu planning, and to highlight gaps. Findings of “no” (not mentioned) were frequent. There are many possible explanations for this, other than “poor planning.” As described in the section on methodology, the approach used for this analysis would have the likely effect of underestimating the robustness of state plans. Nonetheless, a plan is merely an essential first step in a competent response, and true weaknesses in planning could be magnified as responses unfold.

The state pandemic flu plans analyzed here reflected their authorship by public health officials. Many of them addressed core public health functions such as surveillance or vaccine management, though specific aspects of these functions were addressed in varying degrees of depth. This suggests that challenges remain even in areas that are familiar to public health planners, such as: developing schemes to prioritize or ration limited medical assets; coordinating surveillance to optimize early detection and ongoing disease monitoring; and legal liability and civil rights issues associated with disease control measures. Fewer plans addressed leadership and coordination, or the continuity of non-health services, subjects which may be unfamiliar to public health planners, or which may exceed their authority. These elements may require stronger engagement by emergency management officials and others in planning.

This analysis studied pandemic planning at the state level. As with any emergency response, most of the responsibility rests with local authorities. This analysis did not attempt to assess the status of local pandemic planning efforts, though such efforts are also likely to pose significant challenges. Just as public health authority is decentralized to state rather than federal authorities, it is also decentralized in some states, with local health departments having varying degrees of autonomy, further complicating planning efforts.<sup>62</sup>

Variability among states in pandemic planning has been noted in another analysis.<sup>63</sup> The decentralized nature of public health is often cited as an explanation. The federal government cannot directly dictate to states what they must do to prepare, though it can establish certain requirements as a condition of federal preparedness funding. Some flexibility in those requirements is helpful in allowing states to prepare differently for those threats—such as hurricanes, earthquakes and wildfires—that are likely to affect states differently. A pandemic, on the other hand, is more likely to affect states in similar ways that are, to some extent, predictable. This threat may be more amenable to standardized planning approaches, and to more directive federal requirements tied to funding. But the matter of what the states should do to be prepared for a pandemic is not always clear. For example, uncertainties about the ways in which flu spreads, the lack of national consensus in matters of equity in rationing, and a long tradition of federal deference to states in matters of public health, all complicate efforts to set uniform planning requirements for states.

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<sup>62</sup> For more information, see CRS Report RL31719, *An Overview of the U.S. Public Health System in the Context of Emergency Preparedness*, by Sarah A. Lister.

<sup>63</sup> Holmberg et al.

The CRS database analyzed here contains state pandemic plans available as of July 2006. At that point, all states had been required to submit pandemic plans to HHS one year earlier, and all had done so. However, the states were not given specific direction regarding the content of the plans that were required in July 2005, and they were not required to update their plans during the subsequent FY2005 funding cycle.

The guidance that accompanied targeted pandemic funding for FY2006, in accordance with congressional report language, emphasized exercises, assessments, assistance to local jurisdictions in their planning efforts, and other specific tasks, but did not explicitly require that states update their plans, if needed, to keep them current to a certain date.<sup>64</sup> This may reflect a broader trend in disaster preparedness, in which planning is seen as the first step toward a competent response, but the assurance of actual response capability is focused instead on the development and evaluation of exercises, rather than on evaluation of plans.<sup>65</sup>

Exercises and drills test the ability of jurisdictions to execute their plans, and they detect planning gaps. Consequently, assessments of response capability rest not only on assessments of planning, but also on assessments of exercise programs, and integration of findings into subsequent rounds of planning.<sup>66</sup> DHS has developed the all-hazards Homeland Security Exercise and Evaluation Program (HSEEP) to provide standardized policy, methodology, and language for designing, developing, conducting, and evaluating exercises.<sup>67</sup> But it has not published information about the specific application of this approach to pandemic flu preparedness. The RAND Corporation, under contract from HHS, developed the Public Health Preparedness Database, which incorporates evaluation criteria to be applied to exercises, and a searchable database of exercises (including orientations, table-top exercises, and drills) used to evaluate public health preparedness.<sup>68</sup> The database contains two local exercises specifically for pandemic flu, but none at the state level. Also, while pandemic influenza scenarios have been used to exercise specific elements of a public health response, such as distribution of stockpiled medications, there has been no national exercise to test a multi-sector, multi-jurisdictional response to a flu pandemic.

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<sup>64</sup> The CRS database was created using plans available before the FY2006 guidance and funding were provided to states.

<sup>65</sup> See Nicole Lurie, Jeffrey Wasserman and Christopher D. Nelson, "Public Health Preparedness: Evolution or Revolution?" *Health Affairs*, vol. 25, no. 4, pp. 935-945, July/August 2006.

<sup>66</sup> Ibid.

<sup>67</sup> DHS, The Homeland Security Exercise and Evaluation Program (HSEEP), at <https://hseep.dhs.gov/>.

<sup>68</sup> RAND, Public Health Preparedness Database, at <http://www.rand.org/health/projects/php/>.

## Appendix. Funding and Benchmarks for Pandemic Planning

### Federal Pandemic Planning

The United States has engaged in pandemic flu planning activities, with an emphasis on the public health sector, for several decades. The threat posed by H5N1 avian flu has heightened *multi-sector* preparedness activities in recent years. The federal government has been engaged in a coordinated, multi-sector, government-wide planning effort since 2005.<sup>69</sup> Prior to that, in 2004, the Department of Homeland Security (DHS) developed planning scenarios for 15 types of incidents, to assist emergency managers, public health officials, and others in planning across sectors and jurisdictions. A pandemic flu scenario was provided, along with scenarios for biological attacks, a major hurricane, a nuclear detonation, and other threats.<sup>70</sup>

### Federal Funding for State Pandemic Preparedness

Since the terrorist attacks in 2001, Congress has provided almost \$8 billion in grants to states to strengthen public health and hospital preparedness for public health threats. Beginning in FY2002, and each fiscal year subsequently, all states have received annual funding for these activities through two grant programs: one administered by the Centers for Disease Control and Prevention (CDC) to improve state and local public health capacity; the other administered by the Health Resources and Services Administration (HRSA) to prepare hospitals, clinics and other healthcare facilities for bioterrorism and other mass-casualty events.<sup>71</sup> Both agencies are in the Department of Health and Human Services (HHS). Grants for both programs are administered at the state level by the State Health Official, the senior official in charge of the state's department of public health. The grants include requirements for local consultation, and for some pass-through of funding to local authorities. HHS does not have any grant programs that directly fund local or municipal authorities for preparedness activities.

As a common requirement of the CDC and HRSA grant programs, all states and the District of Columbia (DC)<sup>72</sup> were required to develop pandemic flu plans, beginning with their FY2004 awards, and to submit the plans to CDC by July 2005.<sup>73</sup> The FY2004 guidance did not, however,

<sup>69</sup> See White House Homeland Security Council, "National Strategy for Pandemic Influenza Implementation Plan, One Year Summary," July 2007, at <http://www.pandemicflu.gov/plan/federal/index.html>. See also CRS Report RL33145, *Pandemic Influenza: Domestic Preparedness Efforts*, and CRS Report RS22576, *Pandemic Influenza: Appropriations for Public Health Preparedness and Response*, both by Sarah A. Lister.

<sup>70</sup> See DHS, Office of Inspector General, "A Review of the Top Officials 3 Exercise," p. 6, at [http://www.dhs.gov/xoig/assets/mgmt/rpts/OIG\\_06-07\\_Nov05.pdf](http://www.dhs.gov/xoig/assets/mgmt/rpts/OIG_06-07_Nov05.pdf).

<sup>71</sup> See CDC Cooperative Agreement Guidance for Public Health Emergency Preparedness, at <http://www.bt.cdc.gov/planning/#statelocal>; and HRSA emergency preparedness programs at <http://www.hrsa.gov/healthconcerns/default.htm>. See also Government Accountability Office (GAO), "Public Health and Hospital Emergency Preparedness Programs: Evolution of Performance Measurement Systems to Measure Progress," GAO-07-485R, March 23, 2007. Though commonly referred to as grants, these programs are actually cooperative agreements. Congress transferred the hospital preparedness program from HRSA to the HHS Assistant Secretary for Preparedness and Response, effective with FY2007 funds, in P.L. 109-417.

<sup>72</sup> According to the Public Health Service Act, the District of Columbia is considered a state for grant-making purposes.

<sup>73</sup> See CDC, "Continuation Guidance—Budget Year Five, Attachment H, Cross-cutting Benchmarks and Guidance," Cross-Cutting Critical Benchmark #6: Preparedness for Pandemic Influenza, June 14, 2004, at <http://www.bt.cdc.gov/planning/continuationguidance/pdf/activities-attachh.pdf>.

stipulate any requirements for the content of the plans. While earlier guidance had been developed by CDC and state health officials to guide state planning efforts, pandemic planning was voluntary at that time, and the FY2004 requirement did not refer to the earlier voluntary guidance.<sup>74</sup>

All states and DC submitted plans by the July 2005 deadline. Many of the plans, some of which have been updated since the deadline, are publicly available on a pandemic flu information website created by HHS.<sup>75</sup>

The July 2005 deadline corresponded with the deadline for state applications for FY2005 cooperative agreement funds. The FY2005 cooperative agreement guidance reiterated that all states must have a pandemic flu plan, and cited the earlier voluntary pandemic guidance. The FY2005 guidance did not, however, require that states that had already submitted a plan for the July 2005 deadline (all of them had) revise the plan during the FY2005 funding cycle.

In November 2005, after the July 2005 deadline, HHS published the *HHS Pandemic Influenza Plan* (the HHS Pandemic Plan).<sup>76</sup> Part 2 of the plan, “Public Health Guidance for State and Local Partners,” lays out, in a series of supplements, detailed activities to help state and local jurisdictions and healthcare facilities mount an effective response to a pandemic. Activities were provided in the following topical areas:

- Surveillance;
- Laboratory testing;
- Healthcare planning;
- Infection control;
- Clinical guidelines;
- Vaccine distribution and use;
- Antiviral drug distribution and use;
- Community disease control and prevention;
- Managing travel-related risk of disease transmission;
- Public health communications; and
- Workforce support: psychosocial considerations and information needs.

Subsequently, in May 2006, the White House Homeland Security Council published the *National Strategy for Pandemic Influenza, Implementation Plan* (the Pandemic Implementation Plan), which assigned more than 300 preparedness and response tasks to departments and agencies

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<sup>74</sup> CDC and the Council of State and Territorial Epidemiologists developed voluntary pandemic planning guidance for states in 1997, with sections on: command, control and management; surveillance; vaccine delivery; antiviral drugs; emergency response; and communications. CDC, National Vaccine Program Office, “Pandemic Influenza: A Planning Guide for State and Local Officials,” version 1.1, January 1997, unpublished document. A subsequent version of the document (Draft 2.1, also unpublished) states: “The guide has not been formally approved or endorsed by any governmental or non-governmental organization, and should be considered only as an interim (draft) guidance document as national planning efforts are completed.”

<sup>75</sup> See HHS, “State Pandemic Plans,” at <http://www.pandemicflu.gov/plan/stateplans.html>. This site does not, however, consistently post the most current or complete plan for each jurisdiction.

<sup>76</sup> U.S. Department of Health and Human Services, “HHS Pandemic Influenza Plan,” November 2005, at <http://www.pandemicflu.gov/plan/federal/index.html>.

across the federal government, and provided planning guidance for state, local, and tribal entities, businesses, schools and universities, communities, and non-governmental organizations.<sup>77</sup>

In FY2006, Congress provided \$6.1 billion in emergency supplemental funding exclusively for pandemic preparedness. These funds built upon earlier efforts to plan for public health emergencies in general, and pandemic flu in particular. The supplemental funding included \$600 million for state and local pandemic preparedness, to be administered by the CDC through the public health preparedness grant program.<sup>78</sup> All states and territories received portions of the pandemic funding according to a formula, and were required by CDC to conduct a variety of activities involving community-wide (versus health-sector specific) planning, exercises and drills, preparedness of sub-state jurisdictions, and others.<sup>79</sup> Supplemental funding was made available to states in phases, from the spring through the fall of 2006. An additional \$175 million in FY2007 funds was made available in July 2007.<sup>80</sup>

*Targeted state funding for pandemic preparedness was provided to states after the July 2005 deadline for them to submit their pandemic plans.* Prior to the availability of this funding, states were expected to use unspecified amounts of their public health and hospital preparedness funds to carry out pandemic planning. As with emergency preparedness in general, pandemic planning efforts are expected to be ongoing, and supporting documents are to be continually updated (“evergreen”) to reflect current developments.

The CRS database contains state pandemic plans available as of July 2006. At that point, all states had been required to submit pandemic plans to HHS one year earlier, and all had done so. However, the states were not given specific direction regarding the required content of the plans that were required in July 2005, and they were not required to update their plans during the FY2005 funding cycle. The guidance that accompanied targeted pandemic funding for FY2006, in accordance with congressional report language, emphasized exercises, assessments, assistance to local jurisdictions in their planning efforts, and other specific tasks, but did not explicitly require that states update their plans, if needed, to keep them current to a certain date. This is consistent with a broader trend in disaster preparedness, in which planning is seen as merely the first step toward a competent response, while the assurance of actual response capability may be better achieved through the development and evaluation of exercises, rather than through evaluation of plans.<sup>81</sup>

## **Mass Casualty Planning Grants to Municipalities**

The Department of Homeland Security (DHS) administers a number of state, local and municipal grant programs intended to enhance homeland security.<sup>82</sup> One of them, the Metropolitan Medical

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<sup>77</sup> White House Homeland Security Council, “National Strategy for Pandemic Influenza: Implementation Plan,” May 2006, at <http://www.pandemicflu.gov/plan/federal/index.html>.

<sup>78</sup> \$350 million was provided in P.L. 109-148, and \$250 million in P.L. 109-234. These funds are in addition to the approximately \$8 billion provided through the public health and hospital preparedness grants from FY2002 through FY2007.

<sup>79</sup> See CDC, Cooperative Agreement Guidance for Public Health Emergency Preparedness, pandemic influenza guidance supplements, Phase 1 and 2, along with general program guidance for FY2005 and FY2006, at <http://www.bt.cdc.gov/planning/coopagreement/>.

<sup>80</sup> See HHS, “HHS Announces \$896.7 Million in Funding to States for Public Health Preparedness and Emergency Response,” press release, July 17, 2007.

<sup>81</sup> See Nicole Lurie, Jeffrey Wasserman and Christopher D. Nelson, “Public Health Preparedness: Evolution or Revolution?” *Health Affairs*, vol. 25, no. 4, pp. 935-945, July/August 2006.

<sup>82</sup> See CRS Report RL33770, *Department of Homeland Security Grants to State and Local Governments: FY2003 to*

Response System (MMRS) program, first incorporated pandemic planning in guidance to accompany FY2006 funds, and expanded the requirements in guidance for FY2007. Other homeland security grant programs may mention pandemic preparedness, but do not require specific activities or include specific benchmarks for this purpose.

The MMRS program began by awarding contracts to municipalities, requiring the submission of disaster response plans as the contract deliverable. The program's scope now includes planning as well as exercising, training, and equipment purchasing. Currently, MMRS awards are provided annually to 124 of the nation's most populous cities to develop plans and conduct related activities for mass casualty incidents by coordinating efforts among first responders, healthcare providers, public health officials, emergency managers, volunteer organizations, and other local entities.<sup>83</sup> In FY2007, each MMRS jurisdiction received \$258,145 to establish or sustain local mass casualty preparedness capabilities. Each fiscal year, MMRS guidance explicitly requires grantees to update or revise their plans as needed to address new benchmarks.

MMRS guidance for FY2006 funds included an "overarching requirement" that MMRS jurisdictions address a number of pandemic preparedness matters in their planning and operations documents.<sup>84</sup> These matters included reviewing mutual aid agreements to clarify protocols for facility sharing or closure; planning for priority dispensing of flu vaccines and antiviral drugs to first responders; providing enhanced public safety services at mass casualty response facilities; and establishing the legal authorities necessary to allow alterations in standards of medical practice.

MMRS guidance for FY2007 reiterated the FY2006 requirements, and added the additional requirement that funded jurisdictions update their Continuity of Operations (COOP) and Continuity of Government (COG) plans to: define clear lines of succession for key positions; assure the protection of key records, facilities, equipment and personnel; address the operation of alternate facilities; and assure the functioning of emergency communications.<sup>85</sup> The FY2007 guidance also said that jurisdictions should attempt to use CDC funds for the purchase of antiviral drugs and ventilators, before using MMRS funds for that purpose.

Grantees' MMRS plans are not generally publicly available, and were not analyzed by CRS.

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*FY2006*, by Steven Maguire and Shawn Reese.

<sup>83</sup> For more information, see DHS, "FY 2007 Homeland Security Grant Program Allocation Overview," 2007, at [http://www.dhs.gov/xlibrary/assets/grants\\_st-local\\_fy07.pdf](http://www.dhs.gov/xlibrary/assets/grants_st-local_fy07.pdf).

<sup>84</sup> DHS, "FY2006 Homeland Security Grant Program, Program Guidance and Application Kit," pp. 99-100, December 2005, at <http://www.ojp.usdoj.gov/odp/docs/fy2006hsgp.pdf>.

<sup>85</sup> DHS, "FY2007 Homeland Security Grant Program, Program Guidance and Application Kit," pp. 58-64, January 2007, at [http://www.ojp.usdoj.gov/odp/docs/fy07\\_hsgp\\_guidance.pdf](http://www.ojp.usdoj.gov/odp/docs/fy07_hsgp_guidance.pdf).

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